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<p>(54) Title: PIPE CONSTRUCTION THAT PASSES THROUGH A ROOF</p> <p>(57) Abstract</p> <p>A pipe construction that passes through a roof (6) and wherein the lower end of the upper pipe part (9), which extends to above the roof, is connected to the upper end of the lower pipe part, which ends below the roof, by means of a flexible pipe part (1). The joint between the roof (6) and the pipe construction is covered by means of a collar part (11). The flexible pipe part (1) extends from underneath the roof (6) to above the roof and is provided with an annular flange (4), which is connected tightly around the flexible pipe part and which is made of a flexible material. The flange is placed on the slot between the edge of the opening in the roof covering material (6) and the flexible pipe part (1).</p> <div data-bbox="1003 1092 1328 1942"> </div>		

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Pipe construction that passes through a roof

The present invention concerns a pipe construction
5 that passes through a roof and wherein the lower end of
the upper pipe part, which extends to above the roof, is
connected to the upper end of the lower pipe part,
which ends below the roof, by means of a flexible pipe
part, whereby the joint between the roof and the pipe
10 construction is covered by means of a collar part. Such
constructions are used when sewer vent pipes, ventilation
pipes for air-conditioning, cooker-hood exhaust pipes,
etc. are passed through the roof out of the building.

In these constructions, it is known to use an accor-
15 dion-like, flexible pipe part inside the building, as an
extension of the rigid pipe which ends below the roof.
The lower end of the rigid pipe that passes through the
roof is connected to the upper end of this accordion part.
The lead-through itself is accomplished by using a so-
20 called roof plate, which is provided with a conical or
calotte-shaped collar, so-called root cone.

On the market, pipe lead-throughs are available that
are shaped individually in respect of the root plate so
as to comply with the shape of the roof covering, and
25 their size is, e.g., in the case of a tile roof, equal to
one tile, the shape being similar to the shape of a tile,
and in the middle of the lead-through piece there is the
conical part for the lead-through of the pipe. On the
lead-through pipe itself, approximately at the middle of
30 the pipe length, there is a collar part, so-called pipe
cone, which surrounds the pipe tightly and which becomes
placed on the root cone, thereby covering the slot between
the opening in the root cone and the pipe. In this system
the pipe can also be placed vertically irrespective of
35 the inclination angle of the roof covering by making the
opening through the root cone at the desired angle.

On the market, there are also lead-through bellows of
rubber, whose lower end is provided with an aluminium

flange, whereas the upper end of the bellows is tightened onto the pipe by means of a clamp. These lead-through bellows have no accordion part at all, which said accordion part passes to below the roof and to which said accordion part the pipe can be attached by means of a clamp. When lead-through bellows are used, the pipe is supported on the roof constructions from underneath the roof so that the pipe becomes vertical. As a rule, there is little space underneath the roof, for which reason this mode of working is inconvenient.

The tube construction in accordance with the present invention is characterized in that the flexible pipe part extends from underneath the roof to above the roof and is provided with an annular flange, which is connected tightly around the flexible pipe part, which is made of a flexible material, and which is placed on the slot between the edge of the opening in the roof covering material and the flexible pipe part.

In Finland, there are at least 50 different roof covering materials and different shapes. By means of the present invention, individually designed root plates can be avoided, whereby economies are obtained in respect of costs of casting moulds, and the dealers are required to keep only one product on stock.

The roof lead-through in accordance with the invention is suitable for all roof covering materials, such as sheet roofs, tile roofs, felt roofs, etc. The shape of the outer face of the covering material may be any shape whatsoever, e.g. corrugated. The lead-through can also be installed in an existing finished roof afterwards.

The invention and its details will be described in more detail in the following with reference to the accompanying drawings, wherein

Figure 1 is a side view of the components used in the pipe construction of the invention,

Figure 2 is a perspective view of the pipe construction as almost completely assembled and with the roof shown partly in section, and

Figure 3 is a perspective view of a finished pipe construction.

The flexible, accordion-like pipe part 1 is, e.g., made of rubber. At both of its ends there are two cylindrical parts 2, 2' with different diameters, which are placed one after the other and which are interconnected by means of a shoulder 3. In this way, the accordion part can be easily connected with two different pipe sizes by, if necessary, cutting off the outer, smaller cylindrical part 2. In the upper end of the pipe, about 1/3 of the pipe height, counted from the top, there is a projecting flange 4, which has been cast as one piece with the pipe around the pipe. An annular disk 5 of aluminium or lead can be fitted onto the flange part 4 of the accordion pipe 1. The ring 5 is thin and can be bent easily in connection with the installation so as to comply with the shape of the outer face of the roof covering material 6. The ring 5 may be fixed to the flange 4, e.g., by glueing, or it may be separate. The ring 5 may be ready-fixed onto the flange 4 in advance. When the construction is being installed, the accordion pipe is installed into the hole made into the covering material 6 so that the projecting part 4 remains on the covering 6. Sealing paste 7 is placed between the projecting part and the covering material. Screws or rivets 8 are fitted by drilling through the aluminium or lead disk 5 with a dense spacing, so that a water-tight construction is obtained.

Thereinafter the pipe 9 is attached to the upper end of the accordion 1 by means of a clamp 10. Hereupon the root cone 11 is installed by means of screws 15 onto the covering material. The upper end of the root cone 11 is provided with a ready-made opening, whose plane is at a suitable angle, e.g. of about 20° , relative the base plane 12 that surrounds the cone. The opening is to such an extent larger than the thickness of the pipe that the same cone can be used both on a flat roof and on roofs with different inclinations, e.g. up to an angle of inclination of about 45° . Since the gap between the opening in the

covering material 6 and the accordion pipe 1 has been sealed by means of the flange 4 and the ring 5, the joint between the base plane 12 of the root cone and the covering material 6 does not have to be made tight any more.

- 5 The cone 12 of the pipe is finally installed via the top end of the pipe around the root cone. At the upper edge of the pipe cone, i.e. of the collar 13, there is a cylindrical part 14, which fits tightly around the pipe 9. The lower edge of the pipe cone is partly chamfered, so
10 that, underneath the pipe cone, the base plane 12 of the root cone 11 can be placed in a position corresponding to the inclination of the roof, at the same time as the upper part 14 of the pipe cone is vertical. The pipe 9 is turned together with the pipe cone 13 so that it becomes
15 vertical, whereupon the pipe cone is attached to the root cone by means of screws 16.

The pipe 9 is further attached to the pipe cone by means of screws 17.

- 20 The lower end of the accordion part 1 placed underneath the roof is attached, by means of a second pipe clamp 10, to the upper end of the pipe 17 running inside the house.

- In the solution in accordance with the invention, the flexible pipe part can be passed through the roof covering material perpendicularly to the roof plane. Thus, the
25 hole in the covering material is always circular. It can be cut by means of the same pattern irrespective of the angle of inclination of the roof. The fastening ring 5, which is fitted onto the flange 4, is likewise always circular. Thus, the same simple installation set is
30 suitable for use with different roof inclinations and with different roof covering materials.

WHAT IS CLAIMED IS:

1. Pipe construction that passes through a roof (6) and wherein the lower end of the upper pipe part (9),
5 which extends to above the roof, is connected to the upper end of the lower pipe part (17), which ends below the roof, by means of a flexible pipe part (1), whereby the joint between the roof (6) and the pipe construction is covered by means of a collar part (11) and the flexible
10 pipe part (1) extends from underneath the roof (6) to above the roof, c h a r a c t e r i z e d in that the flexible pipe part (1) is provided with an annular flange (4), which is connected tightly around the flexible pipe part, which is made of a flexible material, and which is
15 placed on the slot between the edge of the opening in the roof covering material (6) and the flexible pipe part (1).

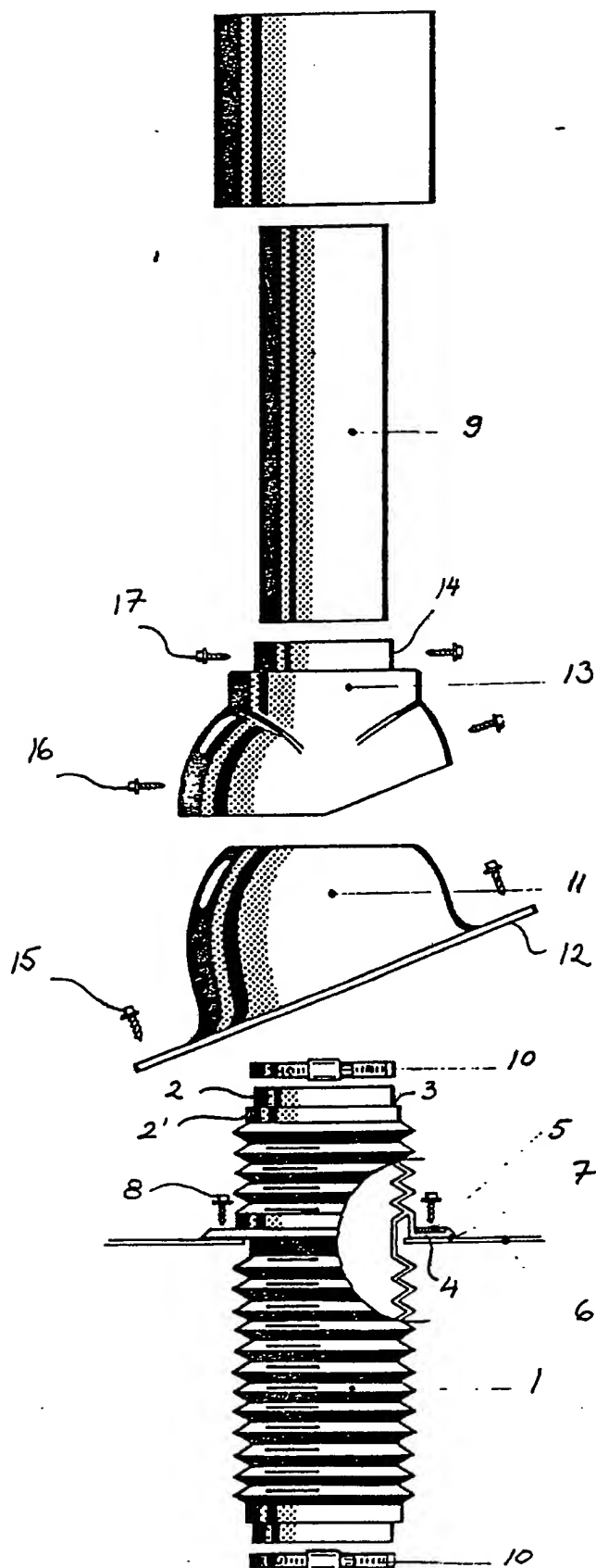
2. Pipe construction as claimed in claim 1, c h a r a c t e r i z e d in that the flexible flange (4) is made of one piece with the flexible pipe part (4).

20 3. Pipe construction as claimed in claim 1 or 2, c h a r a c t e r i z e d in that a fastening ring (5) is fitted onto the flexible flange (4) so as to attach the flange (4) to the roof covering material (6).

4. Pipe construction as claimed in claim 3, 25 c h a r a c t e r i z e d in that the fastening ring (5) is made of a material whose shape can be modified in connection with the installation in compliance with the outer face of the underlying covering material (6).

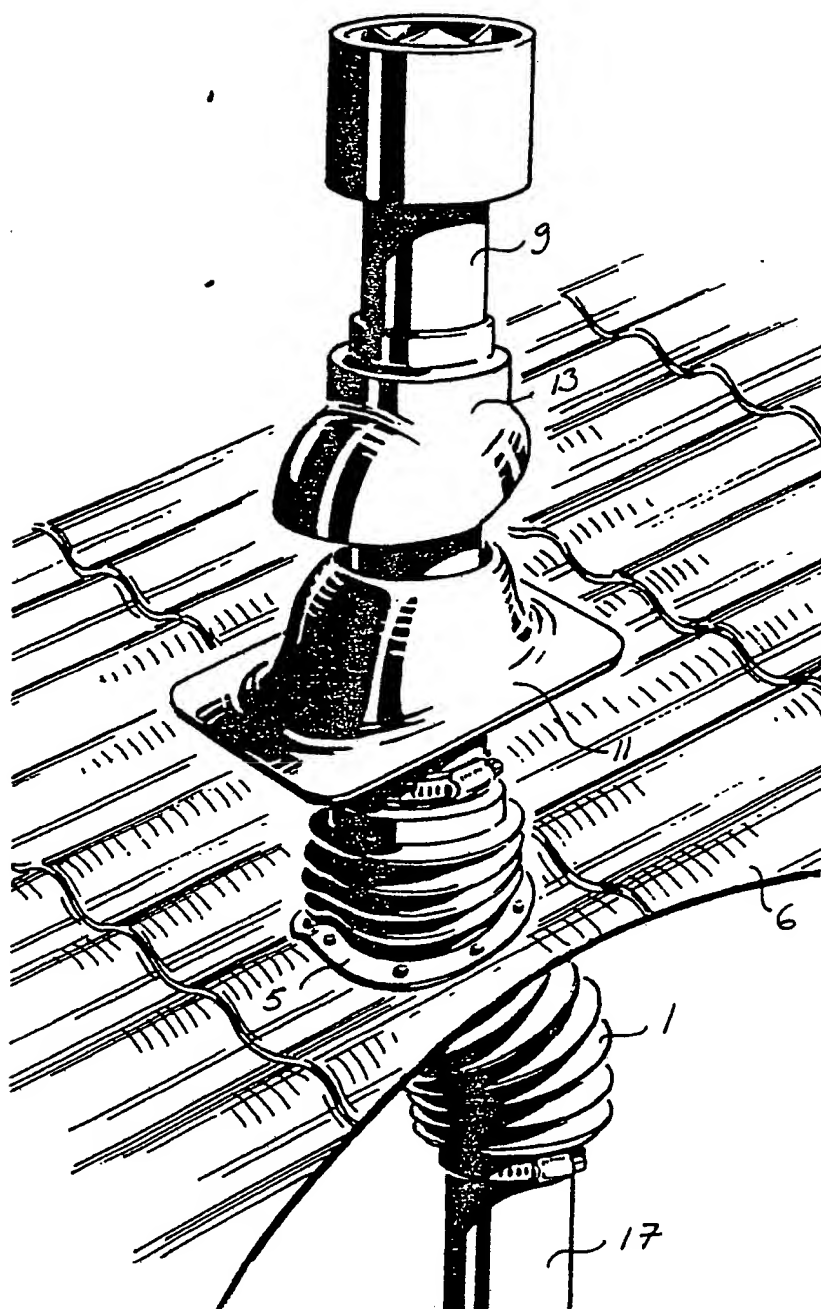
5. Pipe construction as claimed in any of the claims 30 1 to 4, c h a r a c t e r i z e d in that the collar part (11) that covers the joint between the roof (6) and the pipe construction covers the flexible flange part (4).

6. Pipe construction as claimed in any of the claims 1 to 5, c h a r a c t e r i z e d in that at both ends
35 of the flexible pipe part (1) there are two or more cylindrical parts (2, 2') with different diameters, the parts (2) with the smallest diameters being placed as the outermost parts.

Fig. 1^{1/3}

2/3

Fig. 2



3/3

Fig. 3

